

(54) FILLING LINER BAGS WITH LIQUID

(71) TECHNOSEARCH PTY. LIMITED

(21) 25979/84 (22) 29.3.83 (23) 21.3.84 (24) 29.3.83

(43) 4.10.84

(51)³ B65B 31/04 B65B 39/04 B65B 3/16 B65B 3/18

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(74) HL

(57) Claim

1. A method of filling a container fitted with a liner bag, said method comprises the steps of placing a bag made of plastic film and having a substantially rigid sealable filling neck in a container with the neck uppermost and adjacent a top opening in the container, retaining said neck by means of a support means at an elevation so it is accessible, coupling a transfer device which includes an over pressure relief means to said neck, introducing compressed gas through the transfer device until excess gas escapes through said over pressure relief means after inflating said bag to cause it to form a liner for said container, and then introducing liquid into said inflated bag followed by sealing of said neck and the removal of said support means.

25979/84

COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

Application Number: 25979/84 Class Int. Class
Lodged:

Complete Specification—Lodged:

Accepted:

Published:

Priority:

Related Art:

TO BE COMPLETED BY APPLICANT

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LODGED AT SUB-OFFICE

21 MAR 1984

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Complete Specification for the invention entitled:

METHOD AND APPARATUS FOR FILLING PLASTIC LINER BAGS FOR CONTAINERS.

The following statement is a full description of this invention, including the best method of performing it known to me:—



This invention relates to filling bags with liquid. The bags to which the invention is particularly directed are those which line rigid containers and which are made from sheet plastics material. The rigid container envisaged would be of the type composed of four panel sides interconnected and mounted upon a pallet with a base liner board to provide support for the bag over the pallet load supporting battens.

As will be understood if a bag was to be placed in a container and liquid was then introduced through a hole or neck of the bag puckers and creases in the bag would occur and these would be held firm by the pressure of the liquid. As a result the capacity of the bag would be drastically reduced. This invention ensures that creases and puckers of objectionable magnitude will not occur and that the intended capacity of the bag will be available for liquid.

Broadly stated the invention provides firstly a method of filling a container fitted with a liner bag, said method comprises the steps of placing a bag made of plastic film and having a substantially rigid sealable filling neck in a container with the neck uppermost and adjacent a top opening in the container, retaining said neck by means of a support means at an elevation so it is accessible, coupling a

transfer device which includes an over pressure relief means to said neck, introducing compressed gas through the transfer device until excess gas escapes through said over pressure relief means after inflating said bag to cause it to form a liner for said container, and then introducing liquid into said inflated bag followed by sealing of said neck and the removal of said support means.

The invention also provides apparatus for the performance of the method and that apparatus can be said to comprise a transfer device comprising a hollow body with an outlet and inlet means communicating with the interior of said body, said outlet is adapted to be coupled to the inlet of a liner bag of a container and said inlet means is adapted to be coupled to fluid delivery means, a fluid bleed port intermediate the outlet and the inlet means and a gravity closing/pressure opening closure means for the fluid bleed port means which is normally in closed condition and is opened when an over pressure situation develops in a liner bag being filled through said transfer device.

The invention in its presently preferred forms will now be described with reference to the accompanying drawings in which:-

Fig.1 is a perspective view of a bridge of the type proposed

to hold the neck of a liner bag with the liner in a container (as diagrammatically illustrated) during the filling method.

Fig.2 is a sectional elevation of a first form of the transfer device defined above,

Fig.3 is a sectional elevation of a second form of the transfer device,

Fig.4 is a sectional plan view of the body of the transfer device and

Fig.5 is an enlarged fragmentary view of the neck portion of a liner bag as proposed to be used in the invention.

Referring to the drawings the invention is for the filling of a bag indicated 1 which will form a liner for a container 2 composed of four interconnected sides mounted on a pallet P. The sides are formed of frames made of square tubing 3 with an internal lining of plywood 4.

The bridge 5 shown in Fig.1 is made up of two rails 6 joined centrally at 7 and 8 by ties and at one end there are fixed legs 9 joined by a channel 10 adapted to engage over the tubing 3a. There are two legs 11 each with a socket 12 slidable along the rails 6 with locking screws 13 are provided. The legs 11 are joined by a channel 10a to engage over the tubing 3b at the opposited end of the

container.

Between the ties 7 and 8 there is a sheet of plywood or the like 14 with a central hexagonal hole 15. There is a slidable plate 16 with two legs 17 spaced apart by a distance equal to the distance between two opposed sides of a hexagonal undercut 18 in the neck 19 of the bag 1. The neck is adapted by screwing to receive a closure cap 20 and a transfer member to be described.

In a filling operation the bag 1 is placed in the container and the bridge is fixed in place by clamping action of the channels 10 and 10a to the tubing 3a and 3b. The bag neck 19 is passed through the hole 15 and the undercut portion is placed with a corner of the undercut portion 18 in the vee notch V. The plate 16 is then slid into place with the legs 17 under the shoulders of the neck formed by the undercut 18. In this way the bag is supported from the neck as a first part of the filling method.

The transfer device comprises a body 20 made up of two parts 21 and 22 although the body in this arrangement can be made in one piece. The part 21 has a through bore and an end hole 23 threaded to receive a plug 24. There is a branch hole 23a from the bore of the part 21 which exits through a

spigot 32 externally threaded or otherwise adapted to be coupled to a compressed air line. The two parts are fixed together by screws 25. The part 22 has a through bore aligned with that of the part 21 and an internally threaded terminal end 26. There is a flange 27 around the part 22 which is cylindrical and there is a peripheral upstanding rib 28 around the flange 27. Slidably mounted on the part 22 there is a tubular member 29 with an end flange 30 large enough to rest upon the rib 28. There are ports 31 connecting the annular space between the rib 28 and the body part 22 to the bore of the part 22.

In a filling operation the transfer device is threaded onto the bag neck 19, air is introduced into the bag through the branch hole 23a to inflate the bag and cause it to act as a liner for the container sides and base, which is a smooth panel, of say, plywood placed over the pallet load supporting battens. This continues until the air pressure in the bag is sufficient to raise the flange 30 from the rib 28 at which time the bag will be filled and ready for filling with liquid and the air supply will be terminated.

With the bag air filled and spread over the container sides the plug 24 is removed and a liquid supply pipe is inserted into the transfer device to direct liquid into the bag. The

flange to rib engagement 30/28 retains the air in the bag until the air pressure built up by the inflowing liquid is sufficient to raise the flange 30 from the rib 28 thereby permitting the escape of air. This process continues until the bag is filled. At completion the liquid pipe is withdrawn and the transfer device is removed from the bag neck and the cap 20 is fitted thereto. At this stage the bridge can be removed.

The second form of the transfer device is very similar to the first except that the connection at 32 between the body parts 21 and 22 comprises pegs in a groove to allow rotary relative movement between the parts 21 and 22. It will be noted that there is no branch hole 23a. This embodiment is designed for air inflation only, particularly where a plurality of bags are filled and capped preparatory to them being filled at a work station. In each case the bag neck would be held captive in a bridge mounted on the container until the bag was filled with liquid, at which time the bridge would be removed. As the transfer device part 21 will be permanently connected to a compressed air supply the possibility of relative rotational movement between the parts 21 and 22 will facilitate the connection and disconnection of the transfer device to the bag neck 19.

In the foregoing the exit end of the part 22 has been shown with an internal thread. If desired it can be externally threaded and an internally threaded socket member can be used to join the externally threaded body part 22 to the externally threaded neck 19 of the bag.

The claims defining the invention are as follows:-

1. A method of filling a container fitted with a liner bag, said method comprises the steps of placing a bag made of plastic film and having a substantially rigid sealable filling neck in a container with the neck uppermost and adjacent a top opening in the container, retaining said neck by means of a support means at an elevation so it is accessible, coupling a transfer device which includes an over pressure relief means to said neck, introducing compressed gas through the transfer device until excess gas escapes through said over pressure relief means after inflating said bag to cause it to form a liner for said container, and then introducing liquid into said inflated bag followed by sealing of said neck and the removal of said support means.

2. A transfer device comprising a hollow body with an outlet and inlet means communicating with the interior of said body, said outlet is adapted to be coupled to the inlet of a liner bag of a container and said inlet means is adapted to be coupled to fluid delivery means, a fluid bleed port intermediate the outlet and the inlet means and a gravity closing/pressure opening closure means for the fluid

bleed port means which is normally in closed condition and is opened when an over pressure situation develops in a liner bag being filled through said transfer device.

3. A transfer device as claimed in claim 2 wherein the inlet means comprises two inlet ports one of which is aligned with said outlet port.

4. A transfer device as claimed in claim 2 or claim 3 wherein said body includes an external cylindrical portion with an encircling flange, and said fluid bleed port means comprises one or more passageways from the interior of the body which exit through a radial surface of said flange, and a sealing member which is slidably supported on said cylindrical portion with a sealing end adapted to overlie and gravitationally bear on said radial surface and so seal off said passageways.

5. A transfer device as claimed in claim 4 wherein the radial surface of said flange is surrounded by a continuous ridge and the passageways exit into the annular space between said ridge and said cylindrical body portion and the sealing member sealing end is adapted to gravitationally bear on said ridge to seal off said passageways.

6. A transfer device as claimed in anyone of claims 2 to 5 wherein said body comprises two parts, a first part including said inlet means and having an outlet end and the other body part includes said outlet and has an inlet end adapted to be housed in and retained in the outlet end of the first body part.

7. A transfer device as claimed in claim 6 wherein the first body part and the second body part are relatively rotatable.

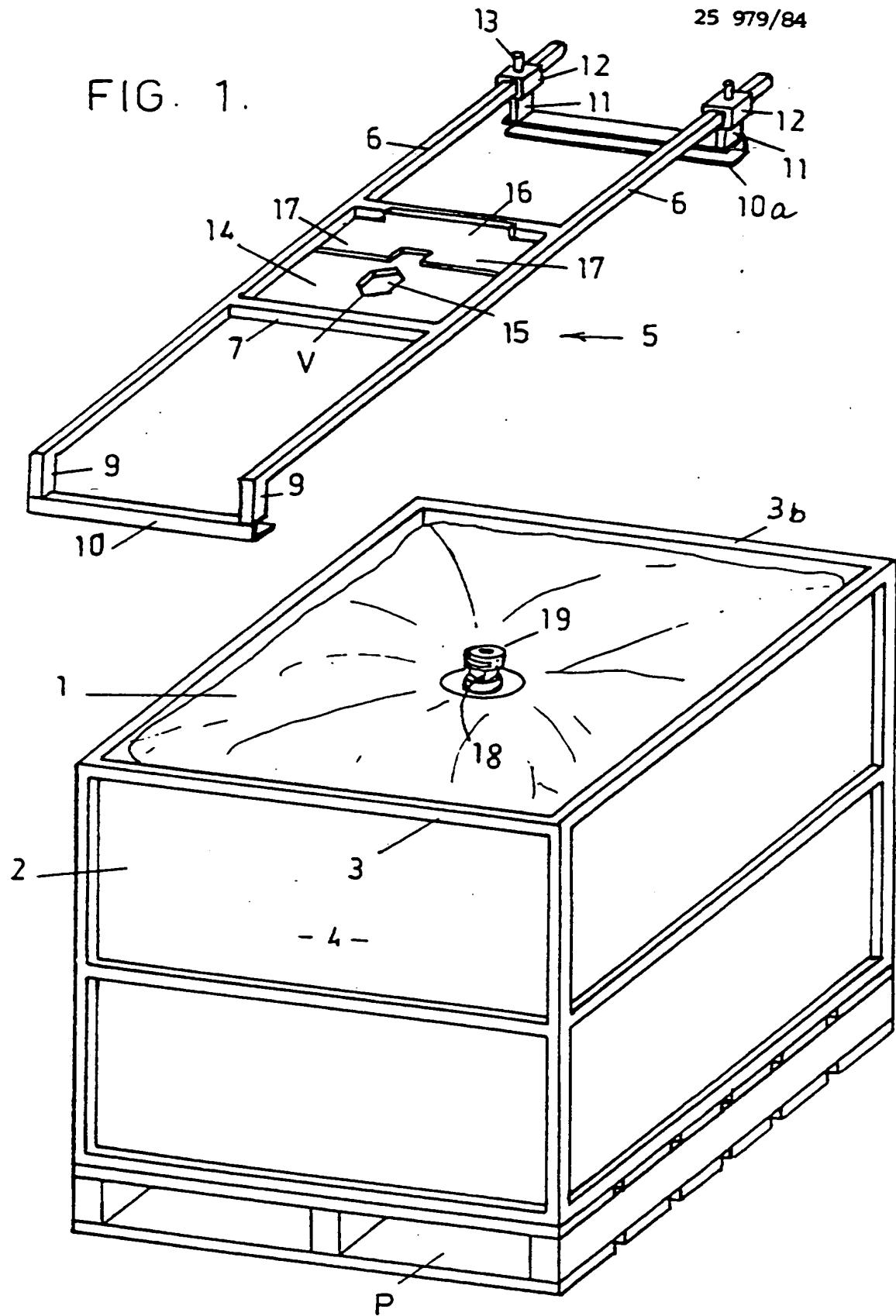
8. A transfer device as claimed in anyone of claims 2 to 7 in combination with a bridge including a fixed notched element and a slidably movable notched element which when combined will retainingly engage the neck of a liner bag, and said bridge includes positioning means to position the bridge on a container with the fixed notch element positioned so that the liner bag neck will occupy a predetermined position relative to said container.

Dated this 13th day of March, 1984.

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By its Patent Attorneys,
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FIG. 1.



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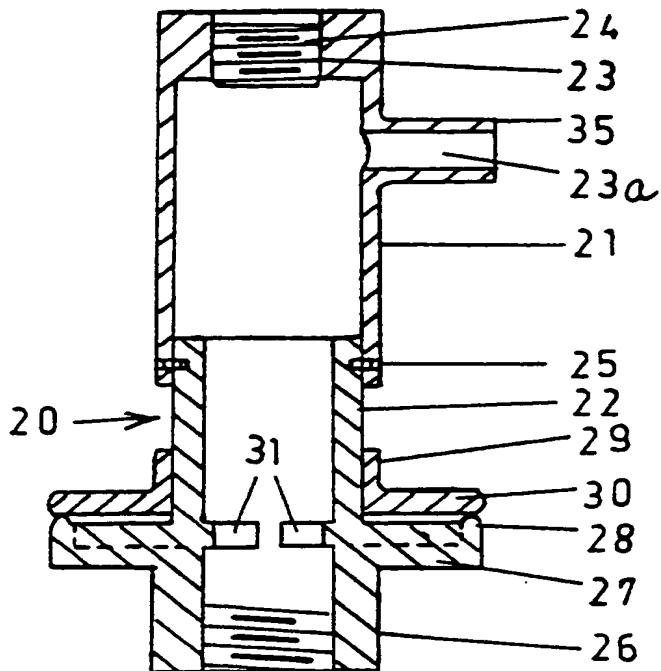


FIG. 2.

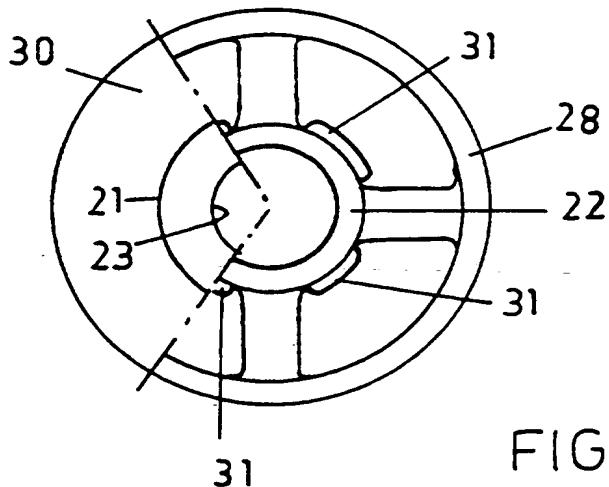


FIG. 4.

FIG. 3.

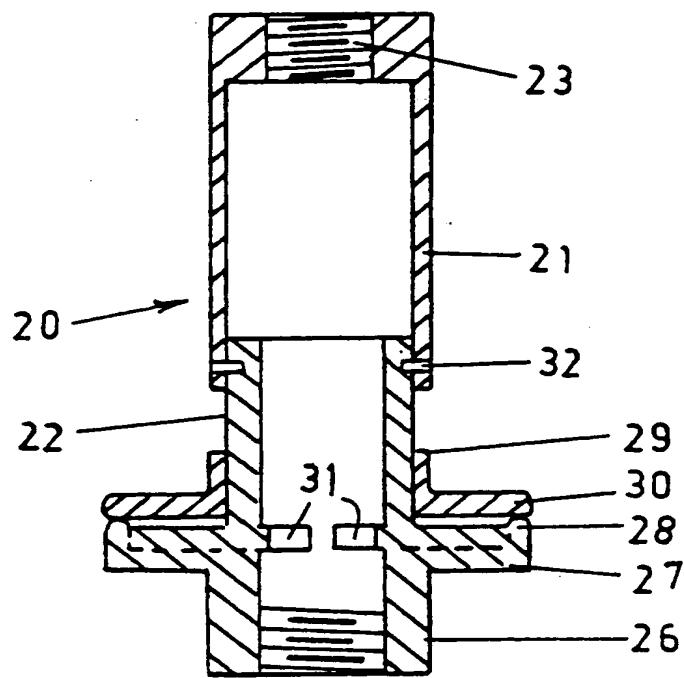


FIG. 5.

